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DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

Y1. NATIONAL PARK

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FILE NO. 143

MONTHLY REPORT

for

May 1923.

143 (May-1923)

June 7, 1923

Dear Sir:

The following is my report on conditions in Yellowstone National Park, and on the operation of the park for the month of May, 1923:

I. GENERAL CONDITIONS

The month was cold and stormy, which made construction work progress rather slowly. On May 8th the roads were opened to Old Faithful, West Yellowstone and Canyon, and on the 18th to Yellowstone Lake. Assistant Engineer Davis, on May 31st, went through Dunraven Pass but encountered innumerable snowdrifts, many of which it will be necessary to blow out with T.N.T. or dynamite shortly before the opening of the season. On the northeast exposure of Dunraven Pass it is estimated that there is 40% more snow than last year and 15% less snow on the north side. Snow conditions on Mt. Washburn appear to be practically the same as last. As a whole, however, the roads are in splendid condition.

Weather

The following weather records are quoted from the report for May of the Observer in charge of the local United States Weather Bureau at Mammoth Hot Springs, park headquarters:

The month as a whole did not depart greatly from the average of past years, it being somewhat colder with a little less than the usual amount of moisture. However, May of this year was warmer than for the three preceding years.

Temperatures: Monthly mean, 45.8°, was 1.6° below normal. The second decade was the most disagreeable, it being stormy

and cold. Only moderate fluctuations of the temperature above and below normal occurred.

Precipitation: Total, 1.71 inches, is 0.20 inch below normal. Showers and thunderstorms were of frequent occurrence.

Snowfall: Total 0.6 inch; normal 4.8 inches. The snowfall was unusually light, and practically all melted as it fell.

Wind: Average hourly velocity, 7.5 miles, is somewhat below the average. The highest velocity was 43 miles from the south on the 19th.

Sunshine: Percentage of possible 58; normal 53.

Rivers

Had not a spell of cool weather occurred around the 26th of the month it is very probable that great damage would have resulted from flood waters of the various rivers and creeks in the park. On April first the gage reading of the Gardiner River was 1.66 feet and the high water mark occurred on May 26th when the reading showed 3.86 feet. By the end of the month it had decreased to 3.24 feet, and during the first few days of June, because of the continuance of cool weather, the river had lowered perceptibly. Both the Lamar and Yellowstone Rivers have been unusually high but gage readings are not available just at this time.

Ice on Lake

The ice on Yellowstone Lake broke up on the night of the 31st and the surface is not yet entirely clear of ice, which is quite contrary to the situation of last year when the ice broke on the 28th and the surface was cleared on the following day.

Roads

About June 2nd or 3rd a crew will start clearing the snow out of Dunraven Pass and from the Mt. Washburn road in order that all roads in the park may be available for travel at the opening of the season. It is expected that Sylvan Pass will be open on June 18th and the Continental Divide on June 15th. Dunraven Pass should be open June 21st and Mt. Washburn about the same time. The road from West Thumb to Snake

River Station will be open shortly after the 20th although we are not giving this road any special attention.

There are attached to this report pictures showing the opening of the roads, and they are marked as follows:

1. Trout Creek drift, Hayden Valley. (Original publication authority granted to Pacific and Atlantic Photos, 25 Park Place, New York City).
2. Two miles north of Yellowstone Lake. (Original publication authority granted New York Times).
3. Three miles north of Yellowstone Lake. (Original publication authority granted to New York Times).
4. Along Yellowstone River five miles north of the Yellowstone Lake. May 22nd. (Original publication authority granted to New York Times).
5. Between 4 and 5 mile posts north of Yellowstone Lake toward Canyon. (Original publication authority granted News Events Photo Service, 306 A World Building, New York City).

Travel

Travel to the park since the closing of the records on September 28th has been carefully checked in order to get the pre-season travel accurate. Up to May 31st 323 cars and 975 people entered the park. The sale of permits starts on June 1st. Present indications are that June travel for this year will be far in excess of that for June, 1922.

Attached hereto is the Chief Ranger's travel report for May, 1923.

Labor and Supply Market

Conditions of the labor and supply market have changed from what they promised to be a month ago, and it looks as if there might be a dearth of men during the summer. We have found it necessary to increase our wages on an average of from 20¢ to 40¢ per day. It is particularly hard to get mechanical help because of the building of the big arena at Shelby, Montana, for the Demsey-Gibbons prize fight where carpenters are being paid \$12.00 per day. Also, the railroads are laying side tracks and the demand for labor is extremely heavy.

Naturally, labor is going where it can get extraordinarily good pay. Also there is a railroad building in eastern Montana and eastern Wyoming into the oil fields and it is draining our source of common labor.

Due to the labor situation it is not going to be possible to finish the Lake Hotel in time for the opening of the season although it is expected that the two upper floors will be ready by July 1st - approximately half of the building. The Hotel Company found it particularly difficult to get carpenters and plumbers. Out of sixty-six letters sent out to prospective carpenters responses were received to only thirteen.

Prospects for crops in the states surrounding the park are unusually good. There will be a brisk demand for labor on the farms this year. We usually find ourselves surrounded on all sides by strong competitors in the labor market but the conditions prevalent this year will mean that our appropriations will not go quite so far as we expected and it may be that the dearth of common labor will make it difficult for us to keep up our roads to the usual standard of repair.

Scale of wages to be paid park employees, effective June 1st.

Two-horse teamster	3.84
Four-horse teamster	4.08
Six-horse teamster	4.32
Grader man	4.24
Grader man (power)	4.36
Powder man	4.24
Painters	6.00
Painters helpers	3.84
Carpenters	5.04-6.00
Carpenters, per month	110.00
Carpenters, per day - rough	4.24
Bridgeman	4.24
Axeman	4.00
Flunkey	3.36
Laborer	3.76
Laborer (Skilled)	4.00
Laborer (Special)	4.24
Cat. operator	5.04
Drillman (air)	4.88
Rollman	5.04
Gravel-loader operator	4.88
Compressor operator	5.04

Hammerman	4.00
Cook, per month	100.00
Cook, per month	120.00
Truck Driver, per month	130.00
Steam shovel operator, per mo. .	200.00
Blacksmith and horseshoer	4.48
Horseshoer (traveling)	5.04
Two-horse team	1.60
Irrigator	4.88
Stone Mason	5.04
Plumber	5.84
Skilled log building worker	6.00
Foreman, sprinkling camp	4.24
Foreman, maintenance	4.32

II. PERSONNEL

On the first day of the month there were 64 appointees on the rolls, and on the last day 63. The following list shows the number of appointees of various classes serving during the month, with a general statement of the kind of work in which they were engaged:

<u>No.</u>	<u>Class</u>	<u>Kind of work performed</u>
1	Superintendent	General administration and supervision of all activities in the park.
1	Asst. Supt.	Administration, purchasing, disbursing.
2.	Asst. Engineers	1 in charge of engineering work in the park, 1 assisting.
6	Clerks	1 Financial Clerk; 1 Cost Accounting Clerk; 1 Personnel, File and Report Clerk; 1 Clerk on orders, proposals and Vouchers, also handling Time and payroll work; 2 stenographer-typists on stenographic work for superintendent.
3	Electricians	Operated power plant regular shift, including Sundays, read meters, did necessary line work.

<u>No.</u>	<u>Class</u>	<u>Kind of work performed</u>
4	Foremen	1 in charge of headquarters corral and work on lawns; two on roads and construction work; one on wagons and sprinkling system.
1	Telegraph Operator	Sent and received all Government Western Union messages, operated one shift on telephone switchboard.
2	Telephone Switchboard Operators	Operated telephone switchboard daily shifts, including Sunday (one under temporary appointment)
1	Blacksmith	General blacksmith work, including shoeing of horses in shop, overhauling and repairing tools and equipment.
1	Master Painter	General shop work including painting equipment and buildings.
7	Labcrers	Teaming, freighting, assisting mechanics and miscellaneous work at headquarters.
1	Steward & Master of Transportation	In charge of all transportation and of storehouses.
1	Chief Buffalo Keeper	In charge of tame buffalo herd.
1	Asst. Buffalo Keeper	In charge of hay ranch operations at Slough Creek.
1	Master Plumber	In charge of general plumbing and water and sewer systems.
1	Auto Mechanic	On duty at power plant.
1	Machinist	Repairing equipment.
1	Carpenter	Repairing buildings at headquarters.
1	Chief Park Ranger	In charge of ranger force.
1	Fish and Game Warden	In charge of special observation and reports on wild animals. Trapping predatory animals.

<u>No.</u>	<u>Class</u>	<u>Kind of work performed</u>
1	First Asst. Chief Park Ranger	In charge of Northern District.
2	Asst. Chief Park Rangers	1 on duty at Lake District. 1 in charge of Western District, and office work at headquarters in the Chief Ranger's office.
10	Park Rangers	Patrolling park borders, pro- tecting game, miscellaneous duties. (One resigned effective May 6, 2 effective May 31st).
8	Temporary Rangers	Patrolling, miscellaneous duties.
8	W A E Park Rangers	In charge of stations.

Leaves of Absence

James McBride, Fish and Game Warden, (noon) May 5 to 12, 6½ days.
A. C. Neumann, Master Painter, May 3-May 4 (noon), 1½ days.
Eivind T. Scoyen, Asst. Chief Ranger, (noon) May 1-2 (noon), 1 day.
Berenice F. Scoyen, Clerk, (noon) May 1-2 (noon), 1 day.
Roby Roy Wisdom, Park Ranger, May 3 to 4 inclusive, 2 days.
William I. Davis, Asst. Engineer, (noon) May 1, ½ day.
Warren H. Loyster, Park Ranger, May 2-26, 22 days.
Burton C. Lacombe, Chief Buffalo Keeper, May 4-7, 3 days.
A. C. D. Henman, Laborer, May 7-9, 3 days.
James McBride, Fish and Game Warden, May 3-4, 2 days.
Lucy Bilkert, Clerk, (noon) May 4, ½ day.
S. T. Woodring, Chief Park Ranger, May 5, 1 day.
Nathan E. Sandel, Telegraph Operator, (noon) May 8-13, 4½ days.
Peter Bilkert, Clerk, May 4-5, 2 days.
Chas. D. Dale, Asst. Electrician, (noon) May 8-12 (noon), 4 days.
Dante T. White, Foreman, May 7-8 (noon), 1½ days.
Albert McLaughlin, Park Ranger, May 8-9 (noon), 1½ days.
Lucy Bilkert, Clerk, May 11, 1 day.
Bert Stinnett, Master Mechanic, May 7-9, 3 days.
John Bauman, Park Ranger, May 14-19, 6 days.
Wm. Wiggins, Master Plumber, May 7-12, 6 days.
Lucy Bilkert, Clerk, (noon) May 16, ½ day.
Ed Burkett, Park Ranger, May 23-31, 7 days.
Joseph Joffe, Clerk, May 19, 1 day.
Lucy Bilkert, Clerk, May 19, 1 day.
Peter Bilkert, Clerk, May 19, 1 day.

Clarence Scoyen, Laborer, May 24-28, 4 days.
John D. Fraser, Machinist, May 23-25, 3 days.
William L. Bicket, Carpenter, May 25 (noon), $\frac{1}{2}$ day.
Charlie R. Stinnett, Blacksmith, May 25 (noon), $\frac{1}{2}$ day.
Lucy Bilkert, Clerk, (noon) May 24, $\frac{1}{2}$ day.
Peter Bilkert, Clerk, May 24, 1 day.
Andrew R. Edwin, Clerk, (noon) May 26, $\frac{1}{2}$ day.
Floyd R. Harriott, Laborer, May 28-May 31, 3 days.
Roy Gray, Laborer, May 18-19, 2 days.
George Webb, Park Ranger, May 7-17, 10 days.

Resignations

Edmund J. McKeon, Auto Mechanic, at \$1320 per annum and quarters, plus increase of compensation, resigned effective close of May 1, 1923.

Henry Anderson, Park Ranger, \$1200 per annum, plus increase of compensation, resigned effective close of May 6, 1923.

Mrs. Berenice F. Scoyen, Clerk, at \$1400 per annum and quarters, plus increase of compensation, resigned effective close of May 19, 1923.

Edward Burkett, Park Ranger, at \$1200 per annum and quarters, plus increase of compensation, resigned close of May 31, 1923.

James F. Wilson, Park Ranger, at \$100 per month and quarters, plus increase of compensation, resigned close of May 31, 1923.

Termination of Furlough

Charles W. Enochs, Foreman, at \$1800 per annum and quarters, plus increase of compensation, returned to duty from furlough on May 9, 1923.

Furloughs

Harry R. Marshall, Auto Mechanic, \$1320 per annum, plus increase of compensation and quarters, furloughed October 16, 1922 to April 15, 1923, inclusive. Extended to include June 15, 1923.

Appointments

John D. Fraser, Machinist, probational, at \$1320 per annum, plus increase of compensation and quarters, effective May 1, 1923.

Miss Anna E. Madsen, Clerk, at \$1200 per annum and quarters, plus increase of compensation, effective May 14, 1923, by transfer from the Washington office.

In addition to the regular employees listed above under appointment, the following were employed temporarily by the day:

	<u>May 1st</u>	<u>May 31st</u>
Laborers	4	44
Skilled Laborers		6
Cooks	2	4
Truck Drivers	1	3
2-horse teamsters	3	8
4-horse teamsters	1	10
Foremen		3
Carpenters	2	7
Irrigators	1	2
Plumbers	2	3
Special Laborers	7	5
Waitress		1
Steam Shovel Operator	2	0
Amman		<u>1</u>
	25	97
Appointees	<u>64</u>	<u>63</u>
Total	89	160

III. WORK COMPLETED

(a) Construction of Physical Improvements

The Trail Bridge across the Gardiner River, east of headquarters, which was started during April, was finished on May

5th. The bridge is about fifty feet long and a rock pier was constructed in the middle of the river to support the beams. The decking is of two inch plank and the railing made of pine poles. This bridge was constructed by ranger labor.

The Horse Pasture near Mammoth for which poles were set last Fall, was wired during the latter part of April and first of May. This pasture contains approximately 160 acres and it is going to do away to a large extent with pasturing surplus horses at Tower Falls, twenty miles from headquarters. The greater part of the work on this pasture was done by rangers.

New Road at Mammoth Camp: A new road, 20 feet wide and 550 feet long, was constructed at the Mammoth permanent camp to connect with the Buffalo Corral road. One 16" culvert, 25 feet long, was placed and 400 feet of the road was surfaced with 3" of gravel.

Lawn Water System: For the past few years it has been noticed that the water from the hot springs, used to irrigate the lawns at Mammoth, was depositing lime in such quantities as to injure the grass. Means have now been provided to utilize the surplus water at the reservoir for irrigating. A hole 9" in diameter was cut through the concrete wall of the reservoir and a gate valve placed to control the flow. After leaving the reservoir the water passes through a steel pipe 350 feet in length, then is carried in a ditch to the lawns. The pipe was a part of the penstock leading to the old power house. It was found heavily coated inside with formation but answers very well for the purpose.

In connection with the improvement, a 24 inch G.I. culvert 30 feet long was installed to carry the hot water under the roadway. A concrete manhole, 4 feet wide, 4½ feet long and six feet deep, was built for an intake and to house the valve.

(b) Maintenance and Repair of Physical Improvements:

Shoshone Forest Road: Foreman Enochs began work May 11th with a crew, making repairs to the road in the Shoshone Forest Reserve.

A rock filled log crib, 40 feet long, also a log side crib, 80 feet long, was built on Clearwater Creek, a short

distance above the bridge, to prevent the stream from cutting a new channel.

A log side crib 107 feet in length was built at Pallisades to prevent further encroachment of the river into the embankment. All cribs are filled with rock.

Several small culverts were placed and the road repaired and graded up to Moss Creek.

A large log drift was blasted out of the river a few hundred feet above the Pahaska Bridge.

Repairs to Gardiner Canyon Road: The road through the Gardiner Canyon was widened for a distance of about 400 feet at a place near the 2 mile post from Gardiner. Several blasts were fired in the sandstone cliffs above the roadway to secure the material for widening. Fifteen hundred pounds of T.N.T. was used which blasted off approximately 1700 cubic yards of rock. The steam shovel, which was held in readiness begun clearing the roadway soon after the blast was fired and in four days a path was cleared wide enough to permit cars to pass through. When possible, the large boulders were rolled into the river first to provide a substantial footing for the fill. Two weeks were required for the steam shovel to clear away the bulk of the material, afterward teams were worked several days to finish.. The steam shovel was also used to clear away the small slide just below the first bridge. Approximately 500 cubic yards of earth were excavated and deposited into the river at this place.

(c) Miscellaneous Improvement Work

Improvements at Reservoir: To improve the general appearance at the reservoirs the following work was done: The timber bridge at the overflow was removed and a 24" culvert, 40 feet long placed. A concrete headwall 28 feet long and seven feet high was built at the end of the culvert. The old tile pipe which carried the overflow water was removed and a concrete and rock spillway built. A fill containing 300 cubic yards of earth was made over the culvert. Twenty feet of 3" tile drain was placed and forty feet of 6" tile drain to care for seepage water. Thirty-six feet of 16" steel pipe was placed to extend the blow-off pipe under the roadway.

The Master Painter, with one assistant the greater part of the month, worked on large junction, ranger station and camp signs, painted two trucks, a touring car and a motorcycle, and did some work in quarters.

The Master Plumber and his helpers completed the comfort station in the Mammoth automobile camp, installing 8 toilets and 2 washbowls, and work was commenced on the new laundry buildings being erected in the automobile camp. 800 feet of 1½" water pipe was installed in this same camp. In the Old Faithful automobile camp he has begun the installation of a complete new water system. General maintenance and repair work was done to the water and sewer system at Mammoth.

The Steward and Master of Transportation with two helpers, for the first fifteen days of the month moved supplies to the new warehouse. The balance of the month was devoted to freighting from Gardiner to Mammoth and sending forage into the park. There were three trucks and drivers in this department.

Headquarters Corral: The work at the headquarters corral has consisted of the regular duties about headquarters in connection with the stables, and extensive improvements have been made on the lawns in preparation for the summer months. Several days were devoted to the hauling of dirt for filling in purposes, and regular care of lawns was begun towards the end of the month under the supervision of Foreman McFarland.

The Master Mechanic and his assistants overhauled Fords Nos. 11 and 17, Mack #3, and finished White #24.

The Carpenter built a truck body and repaired buildings at Mammoth.

The Blacksmiths overhauled ten dump wagons, did iron work on a new truck body, did horseshoeing and general repairs as they came in.

The Power Plant was run constantly with the results shown in comparison for May, 1922, as follows:

	<u>1922</u>	<u>1923</u>
Total current generated, in KWH	18,200	27,234
Of this, sold to public utilities at 5¢ per KWH	1,110	2,943

	<u>1922</u>	<u>1923</u>
Consumed for street lighting	1,959	754
Balance, consumed in Government buildings, for power and lighting, lost on lines in transit	15,141	23,537
Peak load, during month in KWH	42	64

The Telephone and Switchboard Office was open daily from 7:30 A.M. to 8:45 A.M.

Switchboard Calls

On Government Lines	4267
On Hotel Company Lines	571
On Long Distance Connections	<u>218</u>
Total	5056

Telegrams

Government Sent	93
Commercial Sent	<u>97</u>
Total	190
Government Received	48
Commercial Received	<u>105</u>
Total	153

Office Force

The office force was busy with the usual routine work, which includes orders, payment of vouchers, preparation of accounts, reports, general correspondence, etc. 1218 pieces of official mail were received and 1527 were sent out during the month. Special attention was devoted to the preparation of proposals for bids, vouchers, etc., in the accounting section, preparatory to the usual ordering of groceries and other supplies needed for road crews during the approaching season of increased activity in government camps.

Sanitation

Mr. M. B. Hommon, of the United States Public Health Service, arrived in the park June 1st to begin surveys at the Lake center of interest relating to the new sewer system to be built under the 1924 appropriations.

Junior Assistant Engineer Arthur P. Miller, also of the U. S. Public Health Service, who has been working on this same sewer system, was away the greater part of the month, attending to National Park Service work in Rocky Mountain National Park.

Landscape Work

Very great progress has been made in the clearing of unsightly telephone lines from principal views along the road. The line that formally ran through the center of the Mammoth Camp and over the terraces towards Snow Pass has been entirely removed and is being rebuilt northwest of the terraces behind a screen of timber. It does not come to the main road until a point five miles south of here toward Norris. During June the line from Madison Junction to West Yellowstone will be entirely rebuilt on the uphill side of the road, the side away from the River, and in most cases it will be built behind a screen of trees. Following this reconstruction project the unsightly pole line in Lower Geyser Basin leading to the old Fountain Hotel will be removed and placed on the freight road on the other side of the basin entirely out of view of the traveling public.

During the month also there will be a general clean-up of Upper Geyser Basin, removal of government telephone lines from view, removal of debris from the site of the old ranger station and a general clean-up in connection with the completion of the new sewer system.

Extensive clean-up work has been done by the Yellowstone Park Camps Company at its Mammoth Camp where the large new central building is in the process of erection.

Spirit Level Lines

Ensign Edward P. Martin of the United States Coast and Geodetic Survey, arrived in Livingston on May 30th and conferred with me there regarding the beginning of a spirit level line from Livingston to and through the park under the direction of his bureau. On the 31st he established his camp at a point twelve miles north of Livingston and surveys were begun the next morning. More definite data will

no doubt be available for next month's report.

Ranger Force

The protective force performed the usual routine work of patrolling the park, counting and observing game and the usual duties about the stations.

Practically all appointments for the approaching season have been made for both the temporary and permanent force. Plans for assignments to stations, particularly the permanent force, are as follows:

Wisdom, Roby Roy	Sylvan Pass
Bicknell, A. T.	Bechler River
Cottrell, Lee	Snake River
Carter, Forest L.	Old Faithful
Custer, Luther	Thumb
Winn, George	Gallatin
Bowman, Earl	Lake
Dupuis, Jas.	Soda Butte Cabin
Purdue, Wm.	" " Station
Finch, Fred C.	Madison Junction
Bauman, John	Tower Falls
Wells, J.	Hellroaring
Pound, Thad C.	Gardiner
McLaughlin, A. T.	Gardiner
Webb, Lee	Canyon
Webb, George	Norris
Frazier, Roy	Buffalo Corral (Mammoth)
Anderson, Cliff	Thorofare
Seoyen, Clarence	Ranger Truck
Brown, Roy	Riverside
McBride, James	Unassigned.

IV. WORK IN PROGRESS

(a) Construction of Physical Improvements

Trail Work: One man started May 5th on the building of a quarter or half mile of trail along the Gardiner River where the new trail bridge is located to a point connecting with the old Mt. Everts trail.

Four additional laborers were added to the trail force on the 25th and they began work on the new Sepulcher Mountain

trail, which leaves Mammoth at a point near the United States Commissioner's house and up through Chinaman's Gulch, while the old trail ascends a steep grade directly back of the Park Curio Shop. This new trail will, without a doubt, surpass all trails leading from and adjacent to Mammoth, for scenic beauty. Sepulcher Mountain, with an altitude of 9,500 stands 1600 feet higher than Mt. Evans, which is to the northeast only a few miles, and nearly a thousand feet higher than Bunsen Peak, to the south. It is anticipated that this trail will become very popular with saddle horse enthusiasts.

Laundry Building at Mammoth automobile camp: This building is similar in design to the comfort stations. It is 12 x 22 feet in size, with a concrete foundation, log frame with boards and bottoms and the roof covered with a double course of cedar shakes. The building will provide space for seven double laundry tubs and in one end will be a stove to heat the water.

Upper Basin Sewer: On May 29th Foreman White moved his crew to the Upper Basin, where he will do considerable cleaning up work and a few minor jobs in connection with the completion of the sewer system at that place.

Public Utilities

Yellowstone Park Camps Company: Continued building operations on its new Central Building at Mammoth Camp. A crew of sixty men was employed. By the close of the month the building had all the appearance of being completed. Only minor finishing jobs remain. The building will be ready for use June 15th.

The Camps Company also began the construction of a new unit of fifty sleeping lodges. About twenty were completed by the close of the month.

Yellowstone Park Hotel Company: Continued its work of altering rooms and installing water in the old wing of the Mammoth Hotel, and has altered and changed several features in the lobby. Work has begun on the dormitory at Old Faithful, and progress is being made on the new annex to the Lake Hotel.

Yellowstone Park Transportation Company: The Transportation Company continued to work on the drivers' mess house, the additional wing to the bunkhouse, containing 32 rooms, and repaired and overhauled cars, changing wheels on twenty new cars bought in 1922.

(b) Maintenance and Repair of Physical Improvements:

A crew of five men with two teams under Foreman Farrell left headquarters May 14th to make repairs and turn water into the sprinkler supply tanks. By the end of the month they had reached Madison Junction and had all tanks in working order that far.

VI. PLANS OR PROPOSED WORK

On June 1st a crew will start out from Mammoth to put the road in condition to Upper Basin.

On June 8th Foreman White's crew will start work on the new water system for the Canyon Public Automobile Camp.

On June 6th a crew will begin blasting snow in Dunraven Pass.

On June 5th the work of graveling the road across Swan Lake Flat will begin.

About June 15th all sprinkler and small maintenance crews will begin operations.

The new Lake Ranger Station will be completed and made ready for occupancy by June 20th.

VII. POLICIES

No changes to note for May.

VIII. COST OF OPERATION

The cost of operation of Yellowstone National Park will be shown on the Cost Accounting Report for the month of May. This report will be forwarded shortly.

IX. OTHER MATTERS OF INTEREST

Wild Animals

From June to June is the "Game Year" of the park, just as from October to October is the "Travel Year". At this time the care of game ceases to be our most important duty, as during

the summer months the principal problem is handling park visitors. In view of this fact I think it might be advisable to review our game situation for the past year. The Chief Ranger's Report for that period is therefore included in this report.

General: The past year can be considered as excellent from the standpoint of its effect on park game. There were a few drawbacks due to weather conditions but in general there were no conditions or combination of conditions that would result in a large winter loss.

The principal drawback was the June 1922 drought. This month had the lightest rainfall of any June with but two exceptions in the past 33 years. It also had the greatest amount of sunshine since records began in 1904. This situation, although of benefit in some lines, could easily have proved disastrous to our game. Forage in altitudes below 7,000 feet was completely burned out, and the growth of hay at our ranches was stunted and newly planted seed did not germinate. July and August were featured by very wet weather and our forage recovered somewhat, but Fall found us with exceedingly scant grass on our important winter ranges. The benefits derived from this rainfall were more than offset by the effect on our hay crop. It rained nearly every day during the harvest and the hay was cut and stacked under the most discouraging circumstances. The opening of winter found us with only 850 tons of hay on hand, or about 60% of our anticipated crop.

Grass and hay shortage combined is a dangerous situation, but ideal weather during the greater part of the winter offset these adverse conditions. The Fall was open and dry and no great amount of snow fell until after December first and it was not until after the first part of January that there was enough snow on the ground to cause the game any discomfort. Not once during the winter did we have a heavy thaw that would have resulted in crusted snow, making pawing to uncover forage impossible. All game was sensitive to these conditions as shown by the fact that it stayed high throughout the winter, no doubt finding it easier to dig the good grass out of the snow above the 7000 foot level than to rustle for the scant forage in the lower altitudes. Our regular "home guards" came down at the first sign of winter, and it is worthy of note that about 98% of our winter losses occurred among this game which frequents the feeding grounds around Mammoth and Gardiner.

Elk: The past year has been nearly ideal for our park elk herds. During calving time in May and June the weather

was warm and clear and as a result we had practically no loss due to weather conditions. Our increase last year was slightly above normal.

The drift of elk the past winter was about normal. There was no evident splitting of herds, as the Northern, Gallatin and Southern herds showed the expected numbers on their winter ranges. A supply of tags was received from the Bureau of Biological Survey late in the winter. It was intended to tag a number of elk in each of the herds in order to secure some information as to the drift routes of these animals. Unfortunately, these were received after the elk had left the vicinity of our traps and no action could be taken this year.

In order that we may be more certain of our ground in handling the elk problem in the future special efforts were made to obtain definite information as to the numbers in the park. Careful check has been kept on all elk seen in isolated sections and several patrols have been made with the idea of getting counts of the various small bands scattered throughout the park. This spring an extensive count was made of the Northern herd. Plans for these counts were very carefully made and the figures are as near accurate as is possible to obtain. The result of this work shows that we have 14,502 elk that were actually seen. It is easily possible that there is an additional 10% that were not counted and I believe there are easily over 16,000 elk in the park at present.

Detailed Statement showing result of census of elk, winter 1922-23.

Northern Supervisory Territory:

	<u>Cows</u>	<u>Bulls</u>	<u>Total</u>
Mt. Norris and Cache Creek Slope	138	83	221
Soda Butte to Lamar Bridge	543	48	591
Lamar Bridge, Specimen Ridge & Tower Creek	726	98	824
Soda Butte, South Slough Creek	1,010	35	1,045
Slough Creek to Hellroaring	2,301	56	2,359
Tower Falls around Yanceys and South 9 mile towards Mammoth	1,797	60	1,857
Blacktail, Hellroaring to Crevice, part of Mt. Everts	2,939	434	3,373
Around Mammoth, Gardiner and rest of Northern Territory	881	8	889
Reece Creek	77		77
	<hr/>	<hr/>	<hr/>
	10,824	824	11,648

Southern Supervisory Territory

	<u>Cows</u>	<u>Bulls</u>	<u>Total</u>
Upper Yellowstone District			70
Pelican Creek			2
Turbid Lake and Vicinity			15
Bechler River	37	11	48
Snake River			53
	37	11	188

Western Supervisory Territory

Gallatin District, including elk outside park	2,425	75	2,500
Madison River & Tributaries	160	6	166
	2,585	81	2,666

Summary

Total in Northern Territory	11,648
Total in Southern Territory	188
Total in Western Territory	2,666
	14,502

Cows 13,586
Bulls 916

Percentage of bulls slightly over 6%.

During a game conference in Livingston last fall the statement was made that there was a shortage of bulls in the park herds. Observations made by rangers show that the percentage of bulls is at least 25%. Our spring count of the northern herd count this spring shows over 7% bulls. It should be remembered, however, that the count was made late in the spring and at that time the bulls had left the herds and penetrated above the snow line to the high windswept ridges and were not counted. According to information obtained from Mr. Callahan of the Forest Service, the bulls in the Gallatin herd total about 2-3/4%. There are many reasons to doubt these figures. In the first place they do not represent the final result of his observations. Rangers in the Western Territory have seen as many as 50 big bulls in one herd. A count of 412 elk on Sandy Butte last Fall showed 83 bulls, exclusive of

last year's calves. According to the Forest Service figures there are only about 75 bulls in this herd of 2,500 elk and this is hardly possible.

One of the complications in the matter of handling our elk herd is the fact that several different departments are interested in the so-called "Yellowstone Elk Problem". The fact that the elk leave the park during the winter and enter the adjacent states and also the National Forests has given the state game departments and the Forest Service problems of their own regarding this animal. In order that there might be better understanding in the future regarding this problem a conference was held at Livingston, Montana, last Fall, at which representatives of the Montana State Game Department, the Forest Service and the National Park Service were present. An agreement was drawn up which should result in material benefit to the situation and also result in giving the game much better protection outside of the park.

Losses the past year amounted to very little. As near as we are able to determine, 61 of the elk that left the park in the Fall were killed by hunters. Winter kills, death by accident, etc., amounted to about 50 additional, making the total loss from all causes 111 head, or a percentage loss of less than 1%. During the winter the practice of driving elk to keep them in the park was discontinued and I believe that our light loss is one of the good results of this action.

Antelope: Our antelope came back in excellent shape. Last spring a careful count showed 218 in the herd. Our winter's loss from all causes totalled 5 head, or about 2%. This spring we had 253 animals, a net increase of 35, or about 16%.

The antelope herd has showed a steady decrease since the construction in 1914 of the line fence that extends four miles west from Gardiner. Many close observers were of the opinion that this fence interfered with the natural drift of these animals, forcing them to winter in the higher altitudes of the park where snow conditions covered their natural forage, and left them at the mercy of predatory animals. This fence was built to keep the antelope in the park in order that we could give them better protection from hunters. In view of the conditions existing at that time I think the construction of this fence was entirely justified. There were men outside the park that would kill an antelope at the slightest opportunity and we did not have the complete cooperation of the Montana State Game Department for their protection as we have at the present time.

In view of our experience during the winter of 1921-22, it became absolutely certain that the antelope could not exist in the park during a severe winter. This resulted in a complete change in our policy of handling the herd. Instead of trying to hold them in the park we raised the fence and allowed them to go where they pleased. Under an agreement with the Montana State Game Commission two men were stationed at Hoppe's Ranch, outside the park, made state game wardens, and charged with the protection and observation of the antelope. Our experience the past winter shows that these animals will not leave the park until forced to do so by weather conditions and at no time do they go more than two or three miles below the line. Although only a short distance from the park there is a large difference in snow conditions and there is chance for escape from predatory animals. During the past winter we kept a coyote hunter on the antelope range at all times and we had but two kills the entire winter due to coyotes.

It seems certain that the only salvation for the antelope lies in pursuing the same course in future years as was pursued during the 1922-23 winter. However, the winter was reasonably mild and it is not possible to state definitely that we have solved the problem completely until the antelope have shown that they can survive exceptionally severe weather under these new conditions.

Buffalo, Tame Herd: Haying was started at the Buffalo Ranch on August 1st and was completed on the 31st. There were 350 tons of hay harvested.

The main herd was let loose from behind the drift fence November 25, 1922, and on December 17th the feeding began. The calves, with the exception of eight that were Fall calves and too young to wean, were cut from the cow herd and fed in the corrals. Of the calves 41 were males and 68 females. 22 males were castrated. The calves were turned into the main herd February 20th. Between the 18th and 22nd the main herd was taken across the River to feed and was brought back on the 31st of March.

Hay Fed

15 tons	December, 1922
65 "	January, 1923
85 "	February
130 "	March

Buffalo, Wild Herd: About the most interesting point in connection with wild life in the park is the fact that we

have the last herd of wild buffalo on this continent. This remnant of the millions that once roamed the Western plains has its range in the Lamar River and Pelican Creek valleys and apparently desires nothing more than to be left alone. Attempts in the past to improve this herd by feeding, herding or other means have met with decided failure and it is evident that they will have to work out their own destiny.

In line with our policy of obtaining accurate information as to the numbers of the different wild life in the park, rangers were sent to their winter ranges during April and ordered to make a complete count of the herd. They found two different and widely separated bands, one on Pelican Creek and the other on the Lamar River. The following is a detailed statement of the count.

Pelican Creek Section:

Raven Creek	3	
Upper Pelican Creek	3	
Astringent Creek	3	
Pelican Creek Meadows	19	
Mist Creek Divide	1	29

Lamar River Section:

Miller Creek	1	
Calfee Creek	5	
Between Miller and Old Creeks	19	
Saddle Mountain	2	
Between Cache and Miller Creeks	2	
Cache Creek	16	47
TOTAL		76

This herd has shown an increase of about 55% in the last 15 years. The largest number ever counted was 90 head in 1918. However, these animals must have suffered severely in common with other game during the terrible winter of 1919-20, and I think the fact that any survived at all precludes any possibility of their ever becoming extinct unless attacked by disease.

The conditions under which these animals winter indicate a remarkable endurance. Rangers state that they have

practically no winter range and are forced to rely on grass uncovered on windswept ridges for their feed. In several cases warm ground around hot springs keep the snow thawed off and scant amounts of grass are obtainable. Buffalo do not paw the snow as do the elk and deer but brush it aside with their heads. If the snow is three or four feet deep and packed to any extent it seems almost impossible to obtain grass by this method.

Deer: The deer and the bear are two animals that might be classed as beggars of the park. In the summer the bears beg from the tourist and in the winter we find the deer going from door to door begging for scraps from headquarters residents. During the past winter about 20 deer lived on the grounds about Mammoth and subsisted almost entirely on gratuitous gifts from residents.

Deer are increasing rapidly in the park. The last two years have been most noticeable in this respect. As many as 150 were counted between Mammoth and Gardiner this spring. In Cottonwood Basin several large bands were seen and also around Hellroaring. About 20 have wintered the past two years around the Upper Geyser Basin. Last Fall an unusual number were seen near West Yellowstone a section that has been practically barren of deer for a long time. Late in the Fall there were large numbers in the Upper Yellowstone District. Old timers state that all the deer along the Continental Divide and from the Jackson Hole country pass through this section every Fall and Spring. They cross the Absaroka Range and winter on the Shoshone Slope.

Three white tail deer were seen during the winter. The condition of the little buck that stayed around headquarters the past winter is evidently much improved. Last Fall he was apparently suffering from lumpy jaw but this spring the swelling on his jaw had disappeared.

Mountain Sheep: Last winter special efforts were made to keep count of the number of mountain sheep seen in different sections of the park. By checking all figures were able to account for 233 different animals. There is a possibility that there might have been a duplication of count on one band of 30 head. However, we can easily account for 200 animals that were actually seen and can safely place the total in the park at 250.

The small band in the Gardiner River Canyon was the center of interest for travelers. Several motion picture out-

fits secured excellent movies of them. They will appear in the Hal Roach Production of Jack London's "Call of the Wild", along with other of the park game.

Moose: Moose are scattered in nearly every section throughout the park. They have been seen in the Bechler River, Riverside, Hellroaring, Tower Falls, Mammoth, Snake River, Gallatin, Soda Butte and Sylvan Pass districts. These animals are widening their range each year and are no doubt increasing in numbers in sections where left unmolested. At the present time we have no accurate information as to the exact number in the park. These animals are scattered over such a great area and travel such great distances in a day that it is almost impossible to keep check on them.

The State of Wyoming again had an open season on bull moose and 50 permits were issued. Several of the Upper Yellowstone herd were killed and if the practice of granting these permits is confirmed the moose will eventually leave their first park range and move elsewhere.

Bear: There has been a noticeable increase in the number of bear in the park the past year. They are again becoming numerous enough to be a nuisance. The "Jesse James Bear" continued his practice of holding up cars on the Continental Divide the past season and begging for food.

Several grizzlies were seen on the dump at Old Faithful and Lake during the 1922 summer season. These dumps were moved several years ago and since that time this species of bear has refused to visit the new places, no doubt held back by his natural timidity. At the Canyon as many as 16 grizzlies were seen on the dump at one time and a person remaining in the vicinity the entire evening will see as many as 25 bears, both grizzlies and blacks.

Other Animals: Woodchucks, grounds squirrels and other rodents, as well as rabbits, are increasing rapidly. In some cases the former are becoming a decided nuisance and it is probable that some measures will eventually have to be taken for their control.

Distribution of Animals: Several donations of park animals have been made to municipal zoos and parks. The following is a detailed statement of these gifts:

Bears

City Park, Henderson, Kentucky	1 female.
City Park, Joplin, Missouri	1 "
City Park, Jackson, Mississippi	1 "
	<hr/>
	3

Elk

City Park, Utica, New York	2
City Park, Cleveland, Ohio	3
City Park, Houston, Texas	3 *
A. & M. College of Texas, College Sta- tion, Texas	<hr/>
	3
	11

*One female killed in shipment and replaced later.

Buffalo

City Park, Pocatello, Idaho	1 male
" " Denver, Colorado	1 "
" " Toledo, Ohio	2 females
" " Anaconda, Montana	1 "
" " Cleveland, Ohio	2 "
	<hr/>
	7

Predatory Animal Control: Special efforts were made to control predatory animals the past winter. From the park viewpoint predatory animals are considered as being mountain lions, wolves and coyotes.

There are probably only two or three mountain lions left in the park and no special effort was made to hunt them out.

Up to April 30th the rangers of the park had killed 221 coyotes and 8 wolves, a record kill.

Natural Phenomena

While I have not had an opportunity to very carefully examine the hot springs terraces and the geyser basins I have noted that at Mammoth Hot Springs the volume of water flowing over the terraces is heavier than I have ever observed before. The terraces are remarkably beautiful. Back of Jupiter Terrace and near the road a very old terrace is alive again and is rapidly becoming a very beautiful formation. The Angel Terrace is giving forth a great volume of water and the terrace is building fast toward the north and northeast. The high terrace back of the Angel, which probably should be regarded as the ancestor or forerunner of the Angel, is very active this year, with beautiful coloring, whereas, last year it was quiescent and dry. The Orange Spring is active and both its mound and the White Elephant formation are very wonderfully colored. Hymen Terrace, adjacent to the home of the U. S. Commissioner and almost on a level with the plaza of Fort Yellowstone, is very active in two places and the terrace is building rapidly. The water is very hot and for this reason the algae are lighter than on most terraces. Hymen Terrace has been irregular during the past two or three years and last year it was feared that it was going to die.

At Norris Geyser Basin we find intense activity everywhere. All of the old geysers which, as you know, are small are showing an unusual activity. The new Crater Geyser, sometimes known as the Mud Geyser, just below the Black Crowler, has been very active during the winter and has extended its crater southwestward clear under the boardwalk used by tourists. This will make necessary the reconstruction of a good part of the board walk. Pictures relating to the new geyser are attached to this report and are marked as follows:

6. Crater of new geyser at Norris, action irregular. Trees killed by hot water. (Original publication authority granted to Underwood and Underwood.)
7. Damage done by new geyser at Norris. (Original publication authority granted Underwood and Underwood).
8. Gully cut by water from new geyser. Debris was washed from the hillside where this geyser is located, down into the main basin, covering up in some places the boardwalks used by tourists. (Original publication authority granted to Underwood and Underwood).

The Semi-Centennial Geyser, fifteen miles south of Mammoth in the Roaring Mountain Section, which first erupted

with violent action on August 14th, 1922, is apparently quiescent and it is not likely that it will be in eruption this year. However, at the present time a large stream of snow water is flowing through the crater, making the pool much cooler and thus preventing steam action. It may be that after the snow melts the pool will become hot enough to cause eruptions to resume.

In Lower Geyser Basin conditions seem to be unchanged from those of last year. The Fountain Geyser is still quiescent. On May 24th I saw very fine eruptions of the Great Fountain and the White Dome. Of course the Mammoth Paint Pots are very active and very highly colored at this time of the year when there is plenty of water in the ground.

The Upper Geyser Basin conditions are very similar to those of last year. On Geyser Hill, across the Firehole River from Old Faithful, the small geyser near the Beehive that broke out last year is still very active. We find that during the winter another small geyser has broken out not far from the Giantess and very close to the Teakettle. This geyser is a perfect geyser from the standpoint of eruptions, being regular although small. It looks as though it may become more powerful as it is in a region of many geysers and hot springs.

On May 24th I observed very fine eruptions of Old Faithful, Grand, Riverside, Sawmill and Daisy Geysers. The pools are beautiful as usual. Emerald Pool seems to be overflowing more water than last year, consequently the algae on the ground adjacent to the pool are extensive and more beautiful.

Post Office

Work in the Post Office increased appreciably as additional employees came to the park for service with the Hotel, Transportation and Camps Companies, and preparations for a big tourist season also added to the routine work.

School

The regular session of school, conducted by Mrs. Marriott, closed for the summer season on May 18th. The following is the report for the month, with numbers of promotions for the semester:

	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
Pupils enrolled	11	8	19
No. days taught			20

	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
Days attendance	219 $\frac{1}{2}$	155 $\frac{1}{2}$	375
Days absence	$\frac{1}{2}$	4 $\frac{1}{2}$	5
Percent punctuality	99 $\frac{1}{2}$ %	99-3/8%	99-7/16%

No. Promotions by grades:

II	5	0	5
III	3	7	7
V	3	2	5
VIII	0	2	<u>2</u>

Total Promotions 19

Sickness and Medical Attention

Dr. J. M. Wolfe, National Park Service physician, reports 25 resident calls and 45 office calls for the month of May.

Religious Services

Rev. Geo. C. Koehler, who recently arrived in Livingston, Montana, as pastor of the English Lutheran Church of that city, and Mr. Wm. Friend Day, Episcopal minister who has charge of the territory including the Upper Yellowstone Valley - Livingston, Gardiner and Emigrant, conferred upon Mr. Koehler's arrival in Livingston in May and arranged a tentative program to provide services in the park chapel during the tourist season. Services during the month of May were as follows:

16th, 8 o'clock P.M.	Rev. Geo. C. Koehler.
23rd, 8 " " "	" " " "
27th, 8 " " "	Mr. Wm. Friend Day.

Amusements

The regular moving pictures shown on Friday nights of each week were discontinued for the summer on May 26th.

IX. RECEIPTS AND REMITTANCES

Certified Check #641, dated May 17, 1923,
drawn by H. W. Child on the National
Bank of Montana, Helena, Montana, to

the Director, National Park Service	\$91.11
Certified Check #1084, dated May 18, 1923, drawn by H. W. Child on the National Bank of Montana, Helena, Montana, to the Director, National Park Service, amount	4.28
Certified Check #1491, dated May 11, 1923, drawn by J. E. Haynes, on the First National Bank, St. Paul, Minnesota, to the Director, National Park Ser- vice, amount	1.00
Postal Money Order #51713, dated May 10, 1923, drawn by the Postmaster of Yellowstone Park, on the Postmaster at Washington, D. C., amount	<u>3.47</u>
Total	\$100.86

Cordially yours,

Horace M. Albright,
Superintendent.

The Director,
National Park Service,
Department of the Interior,
Washington, D. C.

JSS

DEPARTMENT OF THE INTERIOR.
NATIONAL PARK SERVICE—YELLOWSTONE NATIONAL PARK.

CHIEF RANGER'S MONTHLY TRAVEL REPORT, MONTH OF May, 1923

	NORTH.		WEST.		EAST.		SOUTH.		ALL TRAIL ENTRANCES.		SUMMARY.	
	Cars.	People.	Cars.	People.	Cars.	People.	Cars.	People.	Horses.	People.	Cars.	People.
<i>No permits sold during May</i> Automobile permits issued -----	98	305	3	6							101	311
Automobile permits issued (complimentary) -----												
Cars entering second time -----												
Motor-cycle permits issued -----												
Total -----	98	305	3	6							101	311
Passengers in horse-drawn vehicles -----												
Passengers on horseback -----												
Passengers on bicycles -----		2										2
<i>Mr. Adolphus Quarta</i> -----		7										7
Passengers on foot -----												
Total incoming passengers with private transportation -----	98	314	3	6							101	320
WITH HIRED TRANSPORTATION.												
Yellowstone Park Transportation Co -----		<i>None</i>										
Total incoming passengers with hired transportation -----												
Total Incoming Passengers -----	98	314	3	6							101	320

Total automobiles in public camping grounds -----	Total passengers Cooke City stage -----	SEASON TOTAL END OF LAST MONTH -----
Total automobile campers in public camping grounds -----	Total visitors Cave Falls—Bechler River Region -----	SEASON TOTAL TO DATE -----
	<i>0 Records for 10 of 100 houses</i>	
		323 975